

EPH

### **Programmable RF Thermostat & Receiver**

Installation and Operation Guide

# **Table of contents**

RFRP-OT Room Thermostat	
Installation Instructions	5
Factory Default Settings	6
Frost Protection	6
Specifications	7
How your programmable thermostat works	8
Mounting & Installation	9
DE14 Wixeless Dessiver	
RF IA WIREless Receiver	
Installation Instructions	12
Specifications & Wiring	13
Mounting & Installation	14
RFRP-OT Room Thermostat	
Operating Instructions	16
LCD Symbol Description	17
Button Description	18
Resetting the thermostat	19
Keypad lock and unlock	19
Setting the date, time and programming mode	20
Factory Program Setting	21

Programming Modes	22
Adjust the program setting in 5/2 Day mode	23
Copy Function	24
Temporary Override	25
Permanent Override	25
Boost Function	26
Holiday Function	27
Backlight mode selection	28
Battery low warning	28
Replacing the batteries	29
Installer menu	30
PO 1 Operating Mode	31
Normal	31
Optimum Start	31
TPI	34
PO 2 Setting high & low limits	36
PO 3 Hysteresis H On and H Off	36
PO 4 Calibrate the thermostat	37
PO 5 Frost Protection	37
PO 6 Exit	37

# Table of contents (Continued)

RFRP-OT Room Thermostat (Continued)	
Installer menu - OpenTherm	
PO 6 Setting DHW temperature	38
PO 7 OpenTherm <sup>®</sup> Information	39
PO 8 DHOP	40
PO 9 Set OpenTherm <sup>®</sup> parameters	40
Exit	42
Controlling an OpenTherm Boiler with multiple CombiPack 4-OT	43
System Architecture	46
RF1A Wireless Receiver	
Operating Instructions	48
Button / LED Description	49
LED Description	50
To connect the RFRP-OT thermostat to an RF1A-OT receiver	51
To disconnect the RFRP-OT thermostat to an RF1A-OT receiver	52



# RFRP-OT Room Thermostat Installation Instructions

# **Factory Default Settings**



Temperature indicator: Switching differential: In built frost protection: Clock: Keypad lock: Operating mode: °C 0.4°C 5°C - Not adjustable 24 hours Off 5/2 day

## **Frost Protection**



5°C

Frost protection is built into this thermostat.

It is pre fixed at 5°C and is not adjustable.

It will only be activated when the thermostat is in the OFF mode and the room temperature falls below 5°C.

# **Specifications**

Power supply:	2 x AA Alkaline Batteries
Power consumption:	2 mW
Battery replacement:	Once a year
Temp. control range:	5 35°C
Ambient temperature:	0 45°C
Dimensions:	130 x 99 x 25mm
Temperature sensor:	NTC 100K Ohm @ 25°C
Temperature indication:	°C
Switching differential:	0.4°C
Frost protection:	Only operational in Off mode
Pollution degree:	Pollution degree 2

# How your programmable thermostat works

When the thermostat is in the AUTO mode, it will operate according to the times and temperatures that have been programmed. The user can select from 6 different programs per day - each with a time and a temperature.

There is no OFF time, only a higher and a lower temperature.

If the user wants the thermostat to be OFF at a certain time, set the temperature for this time to be low. The thermostat will turn ON if the room temperature is lower than the setpoint for the current period.

**Example:** If P1 is set to be  $21^{\circ}$ C at 6am, and if P2 is set to be  $10^{\circ}$ C at 8am, the thermostat will look for the temperature to be  $21^{\circ}$ C between 6am and 8am.

# **Mounting & Installation**

#### **Caution!**

- Installation and connection should only be carried out by a qualified person.
- Only qualified electricians or authorised service staff are permitted to open the thermostat.
- If the thermostat is used in a way not specified by the manufacturer, its safety may be impaired.
- Prior to setting the thermostat, it is necessary to complete all required settings described in the section.

#### This thermostat can be mounted in the following ways:

- 1) Directly mounted on wall
- 2) Free standing Stand Included

## Mounting & Installation (Continued)

- 1) The mounting height should be 1.5 metres above the floor level.
- 2) The thermostat should be wall mounted in the room where the heating is to be controlled.

The place of installation should be chosen so that the sensor can measure the room temperature as accurately as possible.

Choose the mounting location to prevent direct exposure to sunlight or other heating / cooling sources when mounted.

- 3) Fix the mounting plate directly to the wall with the screws provided.
- 4) Attach the thermostat to the mounting plate.
- Lower the flap at the front of the thermostat. There is a battery compartment located below the buttons. Apply downward pressure to remove the cover.
- Insert the 2 x AA batteries and the thermostat will turn on. Close the battery compartment.





## RF1A Wireless Receiver Installation Instructions

# **Specifications & Wiring**

Power supply:	200 - 240Vac 50-60Hz
Contact rating:	250 Vac 10(3)A
Ambient temperature:	0 45°C
Automatic action:	Type 1.C.Q
Appliance classes:	Class II appliance 🗖
Pollution degree:	Pollution degree2
IP Rating:	IP20
Rated Impulse Voltage:	Resistance to voltage surge 2500V
	as per EN 60730

#### Internal wiring diagram for RF1A-OT



 If mains voltage output is required, terminals L & 2 must be electrically linked.

Important: Do not connect Mains Voltage to OpenTherm<sup>®</sup> terminals.

# **Mounting & Installation**

 The RF1A-OT receiver should be wall mounted in an area within 20 metres distance of the wireless thermostat. It is important that the receiver is mounted more than 1 metre away from metal objects as this will affect communication with the thermostat.

The receiver should be installed at least 1 metre from any electronic devices such as radio, TV, microwave or wireless network adaptor.

- Slacken the fastening screw on the bottom of the receiver with a philips screwdriver. The receiver is hinged and can be opened 180 degrees.
- 3) Screw the receiver to the wall with the screws provided.
- 4) Remove the protective cover on the terminal block.
- 5) Insert wires into terminal block in accordance with the wiring diagram.
- 6) Close the cover and tighten the fastening screw.





## RFRP-OT Room Thermostat **Operating Instructions**

## **LCD Symbol Description**



## **Button Description**



# **Resetting the thermostat**

Press the RESET button on the side of the thermostat.

'rst no' will appear on the screen.

Press the 🕀 button.

'rst yes' will appear on the screen.

Press the  $\bigcirc$  button to reset the thermostat.

# **Keypad lock and unlock**



To lock the keypad, press and hold the and  $\bigcirc$  buttons for 10 seconds.

is now locked.

To unlock the keypad, press and hold the and  $\bigcirc$  buttons for 10 seconds.

is now unlocked.

# Setting the date, time and programming mode



# Factory Program Setting



5/2 Day						
	P1	P2	P3	P4	P5	P6
Man Fri	06:30	08:00	12:00	14:00	17:30	22:00
MON-FN	21°C	10°C	10°C	10°C	21°C	10°C
Cal Car	08:00	10:00	12:00	14:00	17:30	23:00
Sat-Sun	21°C	10°C	10°C	10°C	21°C	10°C
			7 Day			
	P1	P2	P3	P4	P5	P6
Man Eri	06:30	08:00	12:00	14:00	17:30	22:00
MON-FN	21°C	10°C	10°C	10°C	21°C	10°C
Cat Cur	08:00	10:00	12:00	14:00	17:30	23:00
Sat-Sun	21°C	10°C	10°C	10°C	21°C	10°C
24 Hour						
	P1	P2	P3	P4	P5	P6
Evendov	06:30	08:00	12:00	14:00	17:30	22:00
Everyday	21°C	10°C	10°C	10°C	21°C	10°C

# **Programming Modes**

The RFRP-OT Room Thermostat has the following programming modes available:

5/2 Day mode	Programing Monday to Friday as one block and Saturday and Sunday as a 2nd block.
	Each block can have 6 different times and temperatures.
7 Day mode	Programming all 7 days individually with different times and temperatures.
24 Hour mode	Programming all 7 days as one block with the same time and temperatures.

If 7 D mode is selected, you can program each day of the week with 6 individual times and temperatures.

If 24H mode is selected, you can only program each day of the week with the same 6 times and temperatures.

# Adjust the program setting in 5/2 Day mode

Press the Prog button once.

#### Programming for Monday to Friday is now selected.

Press the (b) or (c) buttons to adjust the P1 time.Press (ok).Press the (b) or (c) buttons to adjust the P1 temp.Press (ok).Repeat this process to adjust P2 to P6 times and temperatures. Press (ok).

#### Programming for Saturday to Sunday is now selected.

Press the or  $\bigcirc$  buttons to adjust the P1 time.Press Press the or  $\bigcirc$  buttons to adjust the P1 temp.Press Repeat this process to adjust P2 to P6 times and temperatures.Press Press the button to return to automatic mode.Press

While in PROG Mode pressing the  $\frac{1}{1000}$  button will jump from P1-P2 etc without changing the temperature.

While in PROG Mode pressing the *button will jump to the next day* (block of days).

# **Copy Function**

#### Copy function may only be used if the thermostat is in the 7d mode.

Set the times and temperatures for the day that you wish to copy from in programming mode.

When still on the day press the  $\overline{COPP}$  button.

The day of the week that you have selected will be shown with 'COPY' below it.

The next day will begin to flash on the top of the screen.

Press the 💮 button to copy the times and temperatures to that day.

Press the  $\bigcirc$  button to skip a day.

You can copy to multiple days using the 🕀 button.

Press the  $\odot$  button when copying has been completed.

## **Temporary Override**

When in AUTO mode, press the  $\bigoplus$  or  $\bigoplus$  buttons to adjust the temperature setpoint. 'OvEr' will appear on the screen.

Press or after 5 seconds the thermostat will operate in this temperature, until the next switching time.

To cancel temporary override, press the *m* buttton and then press the *m* buttton to return to the automatic mode.

### **Permanent Override**

Press the web button to enter the manual mode (Permanent Override), 'MAN' will appear on the screen.

Press the  $\bigoplus$  or  $\bigoplus$  buttons to adjust the temperature setpoint. Press  $\stackrel{\odot}{\otimes}$  or after 5 seconds the thermostat will operate in this

permanent override.

To cancel permanent override, press the  $\bigcirc$  button and then press the  $\bigcirc$  button to return to the automatic mode.

## **Boost Function**

The thermostat can be boosted to a specific temperature for 1, 2 or 3 hours while the thermostat is operating in all modes except for holiday mode.

Press the is button 1, 2 or 3 times, the time that the boost will be activated to will flash on the screen.

If you do not press any other button the boost will activate to the temperature displayed on the screen after 5 seconds.

If you press the O button the temperature will now flash. You can edit the temperature if you press the O or O buttons.

Press the  $\bigcirc$  button or wait for 5 seconds for the boost to activate.

'BOOST TO' will now be displayed on the screen with the time that it is activated to displayed above this text.

Press the  $\overline{1000}$  button again to deactivate the boost.

# **Holiday Function**

This will switch your heating system off between the start and end times you select .

Press the 📖 button, '**HOLIDAY FROM**' will appear on screen.





The thermostat will now return to the mode it was in before the Holiday settings were entered. To cancel Holiday mode, press the  $\begin{bmatrix} wat \\ wat \end{bmatrix}$  button.

# Backlight mode selection 🕒 AUTO

There are two settings for selection. The factory default setting is AUTO.

- OFF The backlight is permanently OFF.
- AUTO On pressing any button the backlight stays on for 5 seconds.

To adjust the backlight setting, lower the cover on the front of the unit.

Press the  $\bigcirc$  button for 5 seconds.

Press either the or  $\bigcirc$  buttons to select the OFF or AUTO mode. Press the button.

## **Battery low warning**

When the batteries are almost empty, the  $\square$  symbol will appear on the screen.

The batteries must now be replaced or the unit will shut down.

# **Replacing the batteries**

Lower the flap at the front of the thermostat.

There is a battery compartment located below the buttons.

Apply downward pressure to remove the cover.

Insert the 2 x AA batteries and the thermostat will turn on.

Close the battery compartment.



# Installer menu

To access the installer menu, you must hold Prog and OK for 5 seconds.

When in the installer menu, press B, O and ox to navigate and select. Use are, are or or to go back a step.

- P0 1: Mode (Normal / Optimum Start / TPI)
- P0 2: Hi Lo (limiting the thermostat)
- P0 3: Hysteresis (differential)
- P0 4: Calibration
- P0 5: Frost Protection
- P0 6: Exit

# Installer menu OpenTherm® Instructions

- P0 6: Setting DHW temperature
- P0 7: OpenTherm® Information
- P0 8: DHOP
- P0 9: Set OpenTherm® Parameters

Exit

# PO 1 Operating Mode (Normal / Optimum Start / TPI)

#### Nor (Normal Mode)

When the thermostat is in Normal mode, the thermostat will try to reach the target temperature after the program changes.

Example: Program 1 on the thermostat is 21°C for 06:30am and the room temperature is 18°C. The thermostat will start the heating at 06:30am and the room temperature will start to increase then.

### OS (Optimum Start Mode) BOILER PLUS (



When the thermostat is in Optimum Start mode, the thermostat will try to reach the target temperature by the start time of the next switching time. This is done by setting the Ti (time interval) on the thermostat in this menu to 10, 15, 20, 25 or 30. This will allow the thermostat 10, 15, 20, 25 or 30 minutes to increase the room temperature by 1°C.

Ti can be set when OS is selected in the installer menu. í 20°C

#### PO 1 Operating Mode (Normal / Optimum Start / TPI)

OS (Optimum Start Mode)

BOILER PLUS 🧭

(Continued)

To achieve the target temperature when the program starts, the thermostat will read:

- 1. The Room Temperature (RT)
- 2. The Setpoint Temperature (ST)
- 3. The Target Temperature Difference (TTD) is the difference between the setpoint temperature and the room temperature .

The time (in minutes) that it will take to overcome (TTD) is called Optimum Start Time (OST) and its maximum value is 3 hours = 180 mins. This is subtracted from the start time.

As the temperature increases the thermostat will recalculate the OST if the temperature is increasing too quickly.



Example when Ti = 20

Program 1 on the thermostat is 21°C for 06:30am and the room temperature is 18°C. The thermostat will start the heating at 05:30am to reach 21°C for 06:30am @ Ti=20.

Example when Ti = 10

Program 1 on the thermostat is 21°C for 06:30am and the room temperature is 18°C. The thermostat will start the heating at 06:00am to reach 21°C for 06:30am @ Ti=10.



# PO 1 Operating Mode (Normal / Optimum Start / TPI) TPI (Time Proportional & Integral Mode)

When the thermostat is in TPI mode and the temperature is rising in the zone and falls into the Proportional Bandwidth section, TPI will start to affect the thermostats operation. The thermostat will turn on and off as it gains heat so that it doesn't overshoot the setpoint by too much. It will also turn on if the temperature is falling so it doesn't undershoot the setpoint which will leave the user with a more comfortable level of heat.

#### There are 2 settings that will affect the thermostats operation:

 CYC - No. of Heating Cycles per Hour: 6 Cycles
This value will decide how often the thermostat will cycle the heating on and off when trying to achieve the setpoint temperature. You can select 2/3/6 or 12.  2. Pb - Proportional Bandwidth:
2°C
This value refers to the temperature below the setpoint at which the thermostat will start

to operate in TPI Control. You can set this temperature from 1.5°C to 3.0°C in 0.1°C increments.



Example: Program 1 on the thermostat is  $21^{\circ}$ C for 06:30am and the room temperature is  $18^{\circ}$ C. The thermostat will start the heating at 06:30am and the room temperature will start to increase then but will switch itself off before it reaches temperature and allow the room temperature to increase naturally – this cycle may begin again if the thermostat isn't reaching temperature.

# PO 2 Setting high & low limits



This menu allows the installer to change the min. and max. temperature range that the thermostat can be set at.

# PO 3 Hysteresis HOn and HOFF

This menu allows the installer to change the switching differential of the thermostat when the temperature is rising and falling.

HOn is the fall in temperature – Default –  $0.4^{\circ}$ C. This will allow a fall of  $0.4^{\circ}$ C from the setpoint before the thermostat turns on again.

HOFF is the rise in temperature – Default –  $0.0^{\circ}$ C. This will allow the temperature to rise  $0^{\circ}$ C above its setpoint.

# PO 4 Calibrate the thermostat

This menu allows the installer to re-calibrate the thermostat. The current temperature will be displayed on the screen and can be adjusted by pressing the  $\textcircled{}{} Or \bigcirc$  buttons .

# PO 5 Frost Protection 🕒 5°C

This menu allows the installer to activate or de-activate frost protection. When frost protection is activated the thermostat will switch on the boiler when the temperature drops below 5°C.

# PO 6 Exit

This menu allows the installer to return to the main interface.

It is also possible to exit the installer menu by pressing  $(m_0)$ ,  $(m_1)$  or  $(m_2)$  whilst in the installer menu.

# PO 6 Setting DHW temperature

This menu allows the installer to change the DHW temperature of the boiler. The temperature can be set in  $0.5^{\circ}$ C increments by pressing the  $\textcircled{}{}$  or  $\textcircled{}{}$  buttons.

Press the  $\odot$  button to select the desired temperature.

This menu is only available when the thermostat is connected to OpenTherm<sup>®</sup> and DHOP is ON (P08 OT installer menu).

# PO 7 OpenTherm® Information

This menu allows the installer to view information received from the OpenTherm<sup>®</sup> boiler. It may take a few seconds to load information relating to each parameter. The information that can be shown from the boiler is outlined in the table below.

Displayed on screen	Description	Remark
tSEt	Target water temp	
tFLO	Outlet water temp	
trEt	Return water temp	
tdH	DHW temperature	This is only visible if DHOP is On (P08 OT Installer menu)
tFLU	Flue gas temperature	Dependent on boiler
tESt	Outdoor temperature	Dependent on boiler
nOdU	Modulation percentage	
FLOr	Water flow	This is only visible if DHOP is On (P08 OT Installer menu)
PrES	Water pressure	Dependent on boiler

# PO 8 DHOP

This menu allows the installer to activate or deactivate DHW target temperature control from the thermostat. This menu is only available when the thermostat is connected to OpenTherm<sup>®</sup>

# PO 9 Set OpenTherm® Parameters

This menu allows the installer to configure the OpenTherm® parameters.

To access the menu please enter the password "08" with the  $\textcircled{\oplus}$  or  $\textcircled{\ominus}$  buttons.

Press 🔿 to confirm.

The parameters that can be set are outlined in the table below.

Param	Description	Range	Default
HHCH t-1	Maximum set point heating	45 - 85°C	85°C
LLCH t-2	Minimum set point heating	10 - HHCH°C	45°C
CLI t-3	This allows user to select different climatic curves for weather compensation. This only applies to Boilers with an outside sensor connected.	0.2 - 3.0	1.2
InFL t-4	Influence of room sensor on modulation of the boiler. Recommended value is 10.	0 - 20	10
HHbO t-5	This is the target setpoint for your CH flow temperature. Note: this value must be within the range of HHCH and LLCH.	HHCH Max >=ID57 >=LLCH Min	85°C
Exit	Press OK button to turn back to main interface.		

# PO 9 Set OpenTherm® parameters

#### **Climatic Curve**



## Exit

This menu allows the installer to return to the main interface.

It is also possible to exit the installer menu by pressing AUTO, MAN or OFF whilst in the installer menu.

# Controlling an OpenTherm<sup>®</sup> Boiler with multiple CombiPack4-OT

It is possible to have 6 CombiPack4-OT controlling 1 OpenTherm® boiler. To do this it is necessary to make one of the RF1A-OT receivers into a Hub Receiver. This Hub Receiver will receive data from all of the RFRP-OT thermostats and relay this information to the boiler via OpenTherm®.

Note: The Hub Receiver should have a wired OpenTherm® connection to the boiler.

#### Making your RF1A-OT receiver into a Hub Receiver

- Press the Reset 
   button on the receiver that you wish to make the Hub Receiver – Red and Green lights are both solid.
- Immediately press and hold the diameter and buttons for 5 seconds, the red light will start blinking.
- 3. Press the button and the Green light will be solid this is now the hub receiver.
- 4. Press the  $\bigcirc$  button to exit to the normal interface.

# Controlling an OpenTherm<sup>®</sup> Boiler with multiple CombiPack4-OT (Continued)

#### Identifying if a receiver is a Hub Receiver

- 1. Press the **O** button.
- 2. The Hub receiver will flash Green and Red.
- 3. The Normal receiver will just flash Red.
- 4. To exit to main interface press the O button.

#### Pairing the RF1A-OT receivers together

- 1. Press the button on the Hub receiver. Red and Green lights will begin to flash.
- 2. Press the  $\int_{const}^{I}$  button on the next receiver to be paired. The Red light will flash 3 times and then stop.
- 3. Repeat this process to pair more, up to a maximum of 6 receivers.

Once all units have been paired, allow time for the receivers to begin to communicate and receive OpenTherm<sup>®</sup> information from the boiler. This may take approximately 2 – 5 minutes.

You will see the red light flash on the Hub receiver and see a corresponding flash on the other receivers paired to the Hub Receiver when they are sharing information.

You may need to pair the receivers to the thermostats again.

If so, please refer to page 51.

You can tell if your thermostat is receiving OpenTherm<sup>®</sup> information from the boiler by entering the installer menu of the thermostat (Hold Prog and OK buttons for 10 Sec) and go to P07 - Info.

If the installer menu is only showing P01 – P05, the thermostat and/or receiver has not been successfully paired.

#### Disconnecting the RF1A-OT receiver from Thermostats & other Receivers

- Press on the Receiver the red light will flash (red and green light if using a hub receiver)
- 3. The RF connection is now cleared.

## System architecture

#### Example A 1 no. Thermostat controlling OT Boiler



#### Example B 3 no. Thermostats controlling OT Boiler >>

Note: A maximum of 6 thermostats can be used in the system.



OpenTherm<sup>®</sup> Boiler



## RF1A Wireless Receiver Operating Instructions

## **Button / LED Description**





Manual override

#### **Reset button**

Press to reset the receiver

# Wireless connect:

Once voltage has been applied this button may be pressed to initialise the pairing process with the wireless thermostat. Once pressed the red and green LED will begin to flash.

# **LED Description**

OT Connection Normal Operation	Green LED	Red LED
RF1A-OT On	ON	OFF - will flash when communicating via RF
RF1A-OT Off	OFF	ON - will flash when communicating via RF

OT Communication Error	Green LED	Red LED
RF1A-OT On	Constant Flash	OFF
RF1A-OT Off	Constant Flash	ON

RF Communication Error	Green LED	Red LED	
RF1A-OT On	ON	Constant Flash	
RF1A-OT Off	OFF	Constant Flash	

Summary	Green LED	Red LED
RF Communication Error	OFF or ON	Constant Flash
OT Communication Error	Constant Flash	OFF or ON
Normal Operation RF1A On	ON	OFF or Flashing
Normal Operation RF1A Off	OFF	ON or Flashing

# To connect the RFRP-OT thermostat to an RF1A-OT receiver

Please note, If you are installing a CombiPack4 the RFRP-OT thermostat and the RF1A-OT receiver will have a pre-established RF connection so it is not necessary to carry out the RF connection process below.

#### On the RF1A-OT receiver:

Press the o button.

The red light will begin to flash.

#### On the RFRP-OT thermostat:

Press the CONNECT button.

The thermostat will show 'nOE' followed by '---'

Once an RF connection has been established the thermostat will show 'r01' on the LCD screen.

Press the  $\odot$  button to finish the process.

The thermostat is now connected to the RF1A-OT receiver.

# To disconnect the RFRP-OT thermostat from an RF1A-OT receiver

This can be done from either the thermostat or the receiver.

#### On the RFRP-OT thermostat:

Press the CONMECT button. The thermostat will begin to search through the RF channels.

Press and hold the  $\bigcirc$  button for 10 seconds. 'Adr' will appear on the screen of the thermostat.

Press the  $\bigcirc$  button twice to complete the unpairing process. The thermostat RFRP-OT is now disconnected from the receiver RF1A-OT.

#### On the RF1A receiver:

Press the obstruction, the red light will flash.

Red & green lights if using as a hub receiver.

Press and hold connect for about 10 seconds, the receiver will then stop flashing.

The RF connection is now cleared.

Notos	
notes	

Notos	
notes	

Notos	
notes	

## **EPH Controls IE**

technical@ephcontrols.com www.ephcontrols.com/contact-us T +353 21 471 8440



## **EPH Controls UK**

technical@ephcontrols.co.uk www.ephcontrols.co.uk/contact-us T +44 1933 322 072





© 2019-2023 EPH Controls Ltd. 20230123\_CP4\_Instruction\_PK